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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/552,612

10/06/2005

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BALCHIN-15783

6316

25628 7590 10/03/2008  
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EXAMINER

LE, NINH V

ART UNIT

PAPER NUMBER

4151

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/552,612	<b>Applicant(s)</b> BALCHIN ET AL.	
	<b>Examiner</b> Ninh V. Le	<b>Art Unit</b> 4151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-8 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 06 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/06/2005</u> .  | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### *Specification*

#### Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
  - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."

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- (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

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- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.
2. The disclosure is objected to because of the following informalities: “two halves 12 and 14” (Page 4 Line 16-17) needs to be – upper mold half 12 and lower mold half 14 -- to make specification clearer. Correction throughout the specification is necessary to make it clearer. Appropriate correction is required.
3. The disclosure is objected to because of the following informalities: The following terminology is inconsistent with respect to the numbering elements: “narrow cavity 15” (Page 4 Line 12-13) is inconsistent with "cavity 15" (Page 4 Line 16). Correction is necessary throughout the specification to make it clearer. Appropriate correction is required.
4. The disclosure is objected to because of the following informalities: The following terminology is inconsistent with respect to the numbering elements: “peripheral ridge

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18" (Page 4 Line 19) is inconsistent with "alumina ridge 18" (Page 4 Line 26-27).

Correction is necessary to make specification clearer. Appropriate correction is required.

5. The disclosure is objected to because of the following informalities: The following terminology is inconsistent with respect to the numbering elements: "coaxial cable 30" (Page 5 Line 31) is inconsistent with "cable 30" (Page 5 Line 35). Correction is necessary to make specification clearer. Appropriate correction is required.

6. The disclosure is objected to because of the following informalities: The following terminology is inconsistent with respect to the numbering elements: "variable capacitor 32" (Page 5 Line 34) is inconsistent with "capacitor 32" (Page 6 Line 4). Correction is necessary to make specification clearer. Appropriate correction is required.

7. The disclosure is objected to because of the following informalities: The following terminology is inconsistent with respect to the numbering elements: "variable capacitor 34" (Page 5 Line 35) is inconsistent with "inductor 34" (Page 6 Line 4). Correction is necessary to make specification clearer. Appropriate correction is required.

### ***Claim Objections***

8. Claim 6 is objected to because of the following informalities: "pats" (Line 6) needs to be -- parts -- to make the claim clearer.

9. Appropriate correction is required.

10. Claim 1 recites the limitation "the pressure" in line 20. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to – a pressure -- or define a pressure earlier in the claim.

11. Claim 1 recites the limitation "the foaming process" in line 21. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to – a foaming process -- or define a foaming process earlier in the claim.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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14. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. US Patent 5639518 (hereinafter Ando '518) (already of record) in view of Anderson et al. US Patent RE39339E (hereinafter Anderson '339E).

15. **Regarding claim 1, Ando '518 discloses** a method of making a biodegradable foamed body, in which a polymer mixture comprising a biodegradable polymer (soybean protein, Column 15 Table 9) and water (water, Column 15 and Table 9) is introduced into a mould (Mold:M1, Column 16 Table 10), the mould being defined between moulding surfaces of two opposed parts that mate together (Figure 1), wherein the polymer mixture contains no foaming agents apart from water (Column 15 Table 9), each mould part is of electrically conducting material and each of the moulding surfaces is coated with a layer of an electrically insulating material (Each of the molds M1 to M7 has either or both a conducting section 11, which permits the flow of a current...and an insulating section 12 which prevents the flow of current, Figure 1, Column 7 Line 33-36), and wherein radio-frequency signals at a frequency between 1 MHZ and 200 MHZ (Heating device:B Frequency in this case is 27.12 MHz, Column 16 Table 10) are applied between the mould parts (devices A, B, and D...supplying a high frequency current...to a material to be molded through a mold, Column 6 Line 60-62) so that the polymer mixture is heated by dielectric heating (Heating device:B, Column 16 Table 10), such that the water turns to steam, causing the polymer mixture to form a foam, fill the mould and set in no more than 15 s (20 sec., Column 16 Table 13), the mould restricting the flow of steam such that the pressure in the mould rises to above 10 atmospheres during the foaming process. Note, in the field of foam and plastic making, soybean



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protein have been used to make biodegradable thermoplastic polymer, an alternative to petroleum-based polymer. Also note, Ando '518 discloses that the molding surface can be materials other than metal (Column 7 Line 39-44). Therefore, the molding surface of mold M1 of Figure 1 can be an electrically insulating material as stated previously. In addition, Ando '518 discloses that dielectric heating can be done at 13.56 MHz, 27.12 MHz, 40.68 MHz, and 2450 MHz in both dielectric heating devices B and C and where the latter frequency is done by device C only (Column 6 Line 54-59). Furthermore, Ando '518 discloses that the raw materials and manufacturing conditions can be changed (Column 8 Line 52-54). Therefore, the device B and C could be used interchangeably for the same process and still be in the scope of the invention as disclose by Ando '518. Regarding the time that the foam fills the mold and sets, Ando '518 discloses 20 second for excellent foam formation time as indicated by the double circle (Column 16 Table 13). Although, this is slightly outside of the 15 seconds or less range, formation of the foam in the mold is based on several processing factors such as moisture content of the mixture prior to heating in the mold, rate of heat transfer from the heat source to the mixture, rate at which water vaporize, dielectric property of the material in the mixture, and the rheology properties of the combine mixture. As indicated in Table 13 in Column 16, a mixture with moisture content of 30 weight percent prior to molding resulted in an excellent moldability as indicated with a double circle utilizing dielectric heating device B. However, using the same heating device B with mixture moisture content of 50 percent resulted in a good moldability at a longer molding time of 30 second. Thus, a higher moisture content of a mixture prior to molding will take longer to form a foam. In

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terms of mixture and composition, Ando '518 discloses various heating times including 10 and 15 seconds for foam formation with just potato starch and water (Column 17 Table 14 and Table 15). It is clear that, moisture content play an important role in the stability of the final foam product. Foam strength was best produced with moisture content between 5 to 15 percent by weight of moisture at times between 35 to 20 seconds respectively. This was done with same apparatus and processing parameter as previously mentioned. Outside of those moisture ranges, the strength of the molded foam deteriorated. Thus, moisture content of the mixture dictates the strength of the molded foam and the time require for proper foam formation.

16. **However, Ando '518 does not disclose** the water turning into steam which causes the polymer mixture to form a foam, the mold restricting the flow of steam, and the pressure in the mold rising to above 10 atmosphere during the foaming process.

17. **In an analogous art, Anderson '339E discloses** such that the water turns to steam (100 °C., the water begins to vaporize, Column 26 Line 60-61), causing the polymer mixture to form a foam (mixture to "rise", Column 26 Line 62-64), fill the mould (mixture to "rise" and momentarily fill the mold, Column 26 Line 64) and set in no more than 15 s, the mould restricting the flow of steam (vent holes plugged...pressure begins to increase between the molds...preventing the transformation of the remaining solvent into vapor, Column 27 Line 8-9) such that the pressure in the mould rises to above 10 atmospheres during the foaming process (flow of the escaping mixture...pressure and temperature within the mold to further increase to point C on FIG 1, Figure 1, Column 27 Line 14-17). Note, Anderson '339E discloses a solvent as water (Column 26 Line 48-

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49). Anderson '339E discloses the vapor pressure of the water causes the foam mixture to form a skin formation at the mold wall which clogs the vent holes thereby giving rise to the pressure in the mold and prevents the flow of steam (Column 26 Line 62-67 and Column 27 Line 1-9). In addition, Anderson '339E discloses a pressure increase to point C of Figure 1 which is 4.63 atmosphere where water becomes saturated vapor at 150 °C. This pressure is less than 10 atmospheres. However, an appropriate pressure rise in the mold for good mold formation depends on the process and material such as temperature of the mold during foaming process, physical property of the mixture, and composition percentage of the mixture. Also, the size of the mold will can have an influence on how much pressure increase will be appropriate during foaming.

18. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the teachings of Ando '518 and Anderson '339E, and to modify the processing parameter, mold, and biodegradable mixture with water of Ando '518 with the processing pressure parameter of Anderson '339E for the benefit of optimizing a foam structure that is structurally sound, firm, and will not rupture or shrink.

19. **Regarding claim 2, Ando '518 discloses** wherein the radio-frequency signals are applied such that the polymer mixture forms a foam, fills the mould and sets in less than

10 s (Heating time: 20 sec., Column 16 Table 13). As stated in the aforementioned rejection, the time at which the foam fills the mold is process dependent. Time factor is also based on the physical property of the materials in the mixture and the moisture content of the mixture prior to molding.

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20. **Regarding claim 3, Ando '518 discloses** wherein the radio-frequency signals are applied at a frequency between 20 MHZ and 50 MHZ (Frequency in this case is 27.12 MHz, Column 16 Table 10).

21. **Regarding claim 4, Ando '518 discloses** wherein the polymer mixture is at least in part starch-based (sugar, Column 15 Table 9). Note, glucose is a derivative of starch. Glucose is commonly known as sugar.

### ***Claim Rejections - 35 USC § 102***

22. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Ando et al. US Patent 5639518 (hereinafter '518) (already of record). Examiner wishes to point out to applicant that claims 6-8 are directed towards an apparatus and as such will be examined under such conditions. The material worked upon or the processes of using the apparatus are viewed as recitation of intended use and are given no patentable weight (Please see MPEP 2114 R1-2115 R2 for further details).

23. **Regarding claim 6, Ando '518 discloses** an apparatus for making a foamed body from a polymer mixture that contains no foaming agents apart from water, the apparatus including a mould defined between moulding surfaces of two opposed parts

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that mate together (Figure 1), wherein each mould part is of electrically conducting material and is coated with a layer of an electrically insulating material (Each of the molds M1 to M7 has either or both a conducting section 11, which permits the flow of a current...and an insulating section 12 which prevents the flow of current, Figure 1, Column 7 Line 33-36), and means to apply radio-frequency signals between the mould parts (The electrodes in devices A,B...are devices for supplying a high frequency current...to a material to be molded through a mold, Column 6 Line 60-62) so that polymer mixture between the mould parts is heated by dielectric heating (Heating device:B Frequency in this case is 27.12 MHz, Column 16 Table 10), the mould being such as to restrict the flow of steam such that the pressure in the mould rises to above 10 atmospheres during the foaming process. Note, Ando '518 discloses that the molding surface can be materials other than metal (Column 7 Line 39-44). Therefore, the molding surface of mold M1 of Figure 1 can be an electrically insulating material as stated previously. In addition, Andro '518 discloses that the conducting metals can be coated with electrically insulating materials such as ceramic and Teflon® (Column 7 Line 52-55). Furthermore, Ando '518 discloses that the conducting material can be aluminum or stainless steel or any conducting metal such as steel or iron (Column 7 Line 37-49). Also, Ando '518 discloses the electrically insulating materials can a variety material such as polyether ether ketone, polimide resin, and resin-coated wood (Column 7 Line 56-58). Note, heating device B is a high frequency dielectric device as stated in the aforementioned rejection (Column 6 Line 30). Note, it is Examiner's position to give

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no weight to the material worked on or the process of using the apparatus as stated in claim 6.

24. **Regarding claim 7, Ando '518 discloses** wherein the electrically insulating material used to coat the moulding surfaces (Each of the molds M1 to M7 has either or both a conducting section 11, which permits the flow of a current...and an insulating section 12 which prevents the flow of current, Figure 1, Column 7 Line 33-36) is one that is not dielectrically heated. Note, Ando '518 discloses that the molding surface can be materials other than metal (Column 7 Line 39-44). Therefore, the molding surface of mold M1 of Figure 1 can be an electrically insulating material as stated previously. Note, it is Examiner's position to give no persuasive weight to the material worked on or the process of using the apparatus as stated in claim 7.

25. **Regarding claim 8, Ando '518 discloses** wherein, when the mould parts are together, they are held apart by an electrical insulator that is thicker than the gap defining the mould (Figure 1). Note, electrical insulating material is indicated as number 12 of Figure 1. As shown in the figure, the electrical insulating material is thicker than the gap between upper and lower mold which defines the space where molding of the mixture occurs.

### ***Conclusion***

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Errington et al. US Patent 7393492B2, Arentsen et al. US Patent

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6251318B1, Arentsen et al. US Patent 6641758B1, Akamatu et al. US Patent 5308879A, and ATO B.V. WIPO Publication WO/2002/020238.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ninh V. Le whose telephone number is (571)270-3828. The examiner can normally be reached on Monday - Friday 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571)272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NVL

***/Angela Ortiz/***

***Supervisory Patent Examiner, Art Unit 4151***